

What is claimed is:

- 1 1. A process for preparing an advanced epoxy material, comprising the steps of:  
2 continuously providing to an extruder: (i) an epoxy resin having an average  
3 of more than one vicinal epoxy group per molecule; (ii) a linking material having  
4 attached thereto an average of more than one moiety reactive with the vicinal epoxy  
5 group of the epoxy resin; and (iii) a catalytic amount of at least one iminium salt  
6 catalyst for promoting the reaction between the epoxy resin and the linking material;  
7 and  
8 operating the extruder at a temperature greater than 200 °C to cause a reaction  
9 between the epoxy resin and linking material for a sufficient residence time to  
10 produce an advanced epoxy resin; and  
11 continuously removing the produced advanced epoxy resin from the extruder.
- 1 2. The process of claim 1, wherein the iminium salt catalyst has the general  
2 formula  
3 
$$R^1R^2R^3P=N^+=PR^1R^2R^3 \quad Z^-$$
  
4 wherein  
5 each R<sup>1</sup>, R<sup>2</sup> and R<sup>3</sup> is independently an aromatic, inertly substituted aromatic,  
6 aliphatic, cycloaliphatic, inertly substituted aliphatic, or inertly  
7 substituted cycloaliphatic group; and  
8 Z is any suitable anion.
- 1 3. The process of claim 1, wherein the catalyst is a bis(triphenylphosphine)  
2 iminium salt.
- 1 4. The process of claim 2, wherein each R<sup>1</sup>, R<sup>2</sup> and R<sup>3</sup> is independently an  
2 aromatic or inertly substituted aromatic group.
- 1 5. The process of claim 2, wherein Z is selected from the group consisting of  
2 halides, carboxylates, carboxylic acid complexes, conjugate bases of inorganic acids,  
3 and conjugate bases of phenols or an anion derived from a bisphenol or biphenol.
- 1 6. The process of claim 1, wherein the catalyst comprises from about 0.04 to  
2 about 1 weight percent of the combined weight of the reactants.

- 1 7. The process of claim 1, wherein the epoxy resin comprises diglycidyl ethers  
2 of biphenol and halogenated derivatives thereof.
- 1 8. The process of claim 1, wherein the linking material comprises a dihydric  
2 phenol.
- 1 9. The process of claim 1, wherein the extrudate has a weight average molecular  
2 weight from about 1,000 to about 100,000.
- 1 10. The process of claim 1, wherein the extrudate has an epoxide equivalent  
2 weight of from about 500 to about 25,000.
- 1 11. The process of claim 1, wherein the ratio of aromatic hydroxyl groups of the  
2 linking material to epoxide groups of the epoxy resin is between from about 0.01:1 to  
3 about 5:1.
- 1 12. The process of claim 1, wherein the extrusion reaction is conducted at a  
2 temperature greater than about 220 °C.
- 1 13. The process of claim 1, wherein the residence time of the reactants is  
2 between about 0.01 and about 0.5 hours.
- 1 14. The process of claim 1, wherein the process further comprises continuously  
2 providing a solvent to the extruder.
- 1 15. The process of claim 1, wherein the solvent is provided in a minimal amount  
2 necessary to facilitate the delivery of the catalyst.
- 1 16. The process of claim 1, wherein the process is essentially neat.
- 1 17. The process of claim 1, further comprising the step of continuously providing  
2 to an extruder: (iv) one or more chain terminators.
- 1 18. A coating composition, comprising: the advanced epoxy resin of claim 1.
- 1 19. An advanced epoxy resin formed by an extrusion process, wherein the  
2 advanced epoxy resin is the extruded reaction product of an epoxy resin and a  
3 linking material in the presence of an iminium salt catalyst.